tise transition, innovation and sustainable environments ERASMUS MUNDUS
Co-funded by the European Union

Towards transdisciplinary education

TISE communications

Launch Issue

December, 2025

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Editorial Introduction

Towards Transdisciplinary Education: TISE Communications

At a time when societies face increasingly complex and interlinked transitions, the need for new ways of learning, thinking, and acting has never been greater. *TISE Communications* emerges as an experimental journal dedicated to exploring and advancing transdisciplinary education—education that not only connects disciplines but connects people, knowledge systems, and practices. Founded under the umbrella of the Erasmus Mundus Joint Master in Transition, Innovation, and Sustainability Environments (TISE)—a European excellence program co-funded by the European Union—this open platform extends TISE's pioneering work in bridging research and teaching, theory and practice.

TISE Communications is conceived as a living dialogue: a science-to-science, science-to-public, and public-to-public initiative. It invites educators, researchers, practitioners, and students to share reflections, experiences, and insights that push the boundaries of how we teach and learn in times of complex transitions and transformations. By cultivating openness, collaboration, and critical reflection, the journal seeks to foster collective intelligence and knowledge co-creation—building the foundations for the transformative learning models our future urgently demands.

This *Launch Issue* of December 2025 marks the first step in establishing *TISE Communications* as a regular annual journal. With this beginning, we aim to provide an introduction to what has already been achieved and the foundations on which we act. The issue features five special contributions from TISE alumni and lecturers, highlighting the diverse voices and experience of transdisciplinary education. Future issues will feature various formats—including design reports, position papers, dialogue pieces, short essays, and practice notes—allowing educators, researchers, practitioners, and students to share experiences, insights, and experimental approaches. Our goal is to set a foundation for a living community of inquiry, cultivating an ongoing dialogue on transdisciplinary education as a shared and evolving practice.

"Transdisciplinarity is often cited as key to strengthening the capacity of individuals and societies to live and act in times of complexity. But how many know how to make it part of teaching practice? At TISE, we unite international expertise to build a solid framework for transdisciplinary education, moving beyond buzzwords toward adaptable approaches that empower future leaders and serve society. This is what we call "science with society" in action—the essence of real excellence."

Liliya Satalkina,TISE Program Manager

Kay Mühlmann, TISE Program Coordinator

"After all, the main asset of transdisciplinarity is its consensus building capacity. Agreeing on the nature of a problem is already halfway into the solution. The other half then is iteration. Or as Aleksander says in Tarkovsky's movie "The Sacrifice" – If every single day, at exactly the same stroke of the clock, one were to perform the same single act, like a ritual, unchanging, systematic, every day at the same time, the world would be changed".

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Transdisciplinarity in a nutshell

TRANSDISCIPLINARITY STRIVES FOR "DOING SCIENCE FOR SOCIETY" — A GOAL THAT CAN BE ACHIEVED ONLY BY TRANSCENDING TRADITIONAL DISCIPLINARY BOUNDARIES AND FOSTERING MUTUAL LEARNING AMONG DIVERSE ACTORS. THIS APPROACH BUILDS ON TARGETED MULTI- OR INTERDISCIPLINARY RESEARCH, SUPPORTED BY MULTI-STAKEHOLDER DIALOGUE AND STRONG COLLABORATION BETWEEN SCIENCE AND PRACTICE.

A core principle of transdisciplinarity is that representatives from science and practice collaborate on equal terms throughout the entire process — from jointly defining and framing the problem to developing strategies for transformation. The role of science is to generate knowledge and theories that clarify the dynamics and interactions within social, technical, and biophysical systems, providing theory-driven and method-based evidence. Practitioners, in turn, contribute contextualized, experience-based insights that relate directly to the specific problem at hand.

Rather than offering "plug-and-play" solutions, transdisciplinary outcomes present proposals and pathways for addressing specific real-world problems, typically ill-defined, complex, and socially highly relevant. Transdisciplinary processes contribute to capacity building among all participants, foster consensus building on key issues, support the analytical mitigation of emerging conflicts within sustainable transformation processes, and enhance political legitimacy. As a result, the proposed pathways tend to be broadly accepted by diverse stakeholder groups.

Transdisciplinary education in life

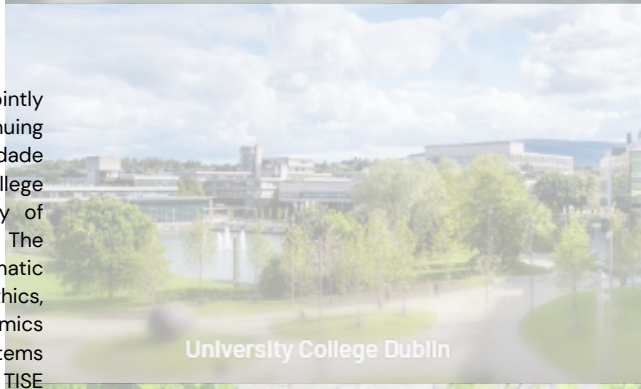
EXPERIENCE FROM EUROPEAN MASTER PROGRAM

THE ERASMUS MUNDUS JOINT MASTER IN TRANSITION, INNOVATION, AND SUSTAINABILITY ENVIRONMENTS (EMJM TISE) IS A UNIQUE INITIATIVE TO INTEGRATE TEACHING AND RESEARCH INTO A TRANSFORMATIVE LEARNING PROCESS, BRIDGING THE KNOWLEDGE–ACTION GAP THROUGH INTER- AND TRANSDISCIPLINARY EDUCATION.

The EMJM TISE focuses on fostering sustainable and resilient societal, business, and industrial processes and structures. The program educates future professionals to initiate sustainable, cross-disciplinary action by combining theory with practice. Through its transdisciplinary approach students gain a comprehensive understanding of coupled human–nature–technology systems, the positive and negative mechanisms of transitional processes (including hidden rebound effects), and potential interventions and innovations. TISE constitutes a research-driven structure that serves as a pilot for transforming higher education institutions into laboratories for the future and incubators of societal transition and transformation towards greater resilience and coherence.

TISE applies three core components of transdisciplinary education. *System thinking* serves as the foundational element upon which all learning processes are built as well as the conceptual core that connects the epistemologies of different disciplines. *Transdisciplinary field research training* is the program's important outcome that consolidates and reflects how students can implement knowledge, skills, and insights that they developed throughout their studies while facilitating the dialog and designing pathways for real-life challenges. *Knowledge integration* is a philosophy and conceptual backbone constituting both the ongoing work of TISE and its forward-looking contribution to research, policy, and society.

EMJM TISE



TISE IS

a four-semester (120 ECTS) MSc jointly offered by the University for Continuing Education Krems (Austria), Universidade Nova de Lisboa (Portugal), University College Dublin (Ireland), and Poznan University of Economics and Business (Poland). The program is built around four thematic clusters—Cultures in Transition; Digital Ethics, Policy and Information Systems; Economics in Transition; and Complexity, Systems Science and Transdisciplinarity. TISE culminates in a joint degree that integrates diverse disciplinary strengths and transdisciplinary methodologies into a coherent curriculum.

TISE ADDRESSES

societal and social transitions and transformation processes for a sustainable future by: (1) recognizing underlying individual, sociocultural, sociotechnical, and socio-economic structures and mechanisms; (2) developing systemic understanding of complex implications across cultural, social, and economic contexts; (3) initiating innovations, interventions, and solution spaces to enable sustainable transitions.

TISE ATTRACTS

a highly diverse student body, until now with participants from over 50 countries and backgrounds spanning social sciences, engineering, economics, environmental studies, law, and the arts, reflecting TISE's broad interdisciplinary reach.

Transdisciplinary Field Research Training

VISION AND MISSION AS PART OF EDUCATION

Transdisciplinary Field Research Training (TFRT) is a core componenet of the EMJM TISE closely focused on the investigation of complex real-world problems. At the center of the TFRT is a comprehensive knowledge integration which aims to transcend disciplinary and system boundaries, create space for new types of knowledge and learning environments, and promote innovative forms of research and partnerships, therefore turning education into a comprehensive empowerment tool within an innovation system. It is a project and case-based research field work where students develop solution orientations for real world problems.

The goal of the TFRT is to enhance science-society collaboration while analyzing complex, multi-dimensional transition patterns of coupled systems, as well as contributing to their resilience by addressing the implications within various dimensions of innovation systems, including relationships between stakeholders.

The foundational principle of TFRT emphasizes that addressing vulnerabilities requires enhancing the problem-solving capacity of innovation systems that leads to society-relevant interventions.

Evolving research endeavor

TRANSDISCIPLINARY FIELD RESEARCH TRAINING IN TISE HAS BEEN DEVELOPING AS AN EVOLVING RESEARCH ENDEAVOR GROUNDED IN THE STUDY OF TRANSITIONS AND TRANSFORMATIONS WITHIN COUPLED HUMAN–NATURE–TECHNOLOGY SYSTEMS, COMPLEX INNOVATION SYSTEMS, AS WELL AS APPROACHES OF KNOWLEDGE INTEGRATION AND SYSTEM DYNAMICS. AS PART OF TISE, TFRT CARRIES SEVERAL DISTINCT FEATURES

TFRT advances the theory and methodology of coupled human-nature-technology systems (HuNTS) by developing shared concepts and a unified vocabulary. This common understanding of problem areas (e.g., vulnerabilities) serves as the foundation for collective actions. The program employs a flexible framework that incorporates corresponding methodologies to address these challenges effectively.

TFRT focuses on sustainability as a dynamic concept because it is not a static, one-size-fits-all model, but rather an evolving idea that adapts to changing circumstances, knowledge, and societal needs. It encompasses a wide range of environmental, economic, and social considerations that must be continuously addressed in response to emerging challenges and opportunities.

TFRT concentrates on innovation systems as a network of elements that enables the generation and distribution of knowledge between individuals, organizations, and regions as part of capacity building to enhance innovation performance, considering various factors and underlying mechanisms, and leading to sustainable innovations as part of comprehensive systemic interventions.

TFRT follows four key steps: (1) developing a holistic understanding of system vulnerabilities within HuNTS; (2) identifying innovation opportunities and designing interventions for qualitative systemic improvements; (3) creating supportive environments that enable these innovations within their broader societal context; and (4) formulating future scenarios to assess the sustainability implications of the proposed interventions.

Find out more about our research:

Satalkina, L., and Steiner, G. (2025). Innovation systems and co-evolutionary development: A systematic literature review. Journal of Innovation & Knowledge 10 (6), article 100808. https://doi.org/10.1016/j.jik.2025.100808

Satalkina, L., Hynek, N. and Steiner, G. (2025). Implementing Multistage Transdisciplinary Modeling for Policy Interventions: An Approach to System Dynamics and Stakeholder Discourse to Maximize Impacts in Austrian Grassroots Sports. Systems Research and Behavioral Science, early access. https://doi.org/10.1002/sres.3159

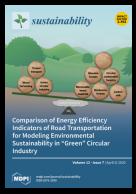
Satalkina, L., Mühlmann, K., Pietrzykowski, M., & Steiner, G. (2024). Empowering future innovators and entrepreneurs by transdisciplinary knowledge integration: universities' role in building competences for navigating poly-crises. Cogent Education, 11(1). https://doi.org/10.1080/2331186X.2024.2439626

Mühlmann, K., Satalkina L., Steiner G. (2023). Dealing with Complexity and Digitalization from a Modern Communication Perspective: How Universities can become Centres for Empowerment. In: Pietrzykowski, M. et al.: Fostering Entrepreneurial and Sales Competencies in Higher Education. Bogucki Wyd. Nauk., Poznań 2023. ISBN 97883-7986-494-2 (DOI: 10.12657/9788379862801)

Steiner, G., Steffelbauer, I., Laubichler, M.D., Zenk, L., Schernhammer, E.S., Birmann, B.M., Bertau, M., Caniglia, G., Mühlmann, K., Satalkina, L., Weitzer, J. (2023): Complexity Literacy for a Sustainable Digital Transition: Cases and Arguments from Transdisciplinary Education Programs. In: Keller, L. et al.: Handbook Digitalization, New Media, and Education for Sustainable Development - Global and National Perspectives and Actions. IGI Global

Satalkina, L., Zenk, L. and Steiner, G. (2022). Transdisciplinary multistage system modeling: migrant entrepreneurship in the digital economy. Kybernetes, Vol. 51 No. 13, pp. 219-240. https://doi.org/10.1108/K-02-2022-0255

Mühlmann K., Satalkina L., Zenk L., Steiner G. (2022) Transition, Innovation and Sustainability Environments, TISE: A Showcase of Education Geared Towards Societal Challenges and Future Orientation. In: Auer M.E., Hortsch H., Michler O., Köhler T. (eds) Mobility for Smart Cities and Regional Development - Challenges for Higher Education. ICL 2021. Lecture Notes in Networks and Systems, vol 390. Springer, Cham. https://doi.org/10.1007/978-3-030-93907-6_94



Satalkina, L., Steiner, G. (2020). Digital Entrepreneurship and its Role in Innovation Systems: A Systematic Literature Review as a Basis for Future Research Avenues for Sustainable Transitions. Sustainability, 12, 2764: DOI: 10.3390/su12072764.

Inside the TFRT

OVER THE LAST 5 YEARS

TRANSDISCIPLINARY EDUCATION CANNOT EMERGE WITHOUT A STRONG CONCEPTUAL AND CONTENT-BASED FOUNDATION THAT CONNECTS DISCIPLINARY EPISTEMOLOGIES. THE TFRT IN TISE SERVES AS A CRUCIAL SOURCE OF KNOWLEDGE INTEGRATION, CONNECTING NOT ONLY DIVERSE AGENTS, BUT ALSO THE DISCIPLINARY EPISTEMOLOGIES THAT SHAPE THEIR PERSPECTIVES.

Through the TFRT, students integrate diverse forms of knowledge from the social sciences, economics, culture, and complexity science to identify vulnerabilities, frame innovation systems, and design interventions that foster resilience and sustainability. Students develop transdisciplinary processes around specific cases that are designed to reflect real-world issues and are facilitated by experts in the relevant fields. The intervention design and scenario reflections are done in collaboration with key stakeholders from both academia and practice. Each TFRT culminates in the development of a white paper, prepared by students as both the final deliverable of the TFRT and a tangible contribution to research, policy, and practice—demonstrating the real-world relevance and impact of transdisciplinary education within TISE.

The specific thematic areas addressed within the TFRT are grounded in the TISE curriculum, while the overarching topic is the fragmentation of society and resilience. The thematic domains or cases are proposed by consortium partners and experts with specialized knowledge in particular fields. This principle is essential, as it ensures that students receive guidance from supervisors with deep expertise and established research backgrounds. Some cases are general and relatively fixed, while others are flexible and often linked to ongoing projects. In all cases, students formulate research questions and design appropriate methodologies according to the principles of a transdisciplinary approach.

Thematic structure of the TFRT

General cases

Fragmentation and Polarization through Digital Media

DEVELOPED BY JORGE MARTINS ROSA, NOVA

After initial optimism about social networks as drivers of democratic engagement, recent research highlights their dual role in both empowering marginalized voices and fostering polarization and hate speech that undermine democratic values. The TFRT project explores, in concrete contexts and with affected communities, the threats of polarization through digital media and the opportunities to counteract its effects.

Digitisation and automation of public services

DEVELOPED BY MARGUERITE BARRY, UCD

The digitisation and automation of public services—driven by AI and machine learning—are transforming how citizens interact with essential systems, raising questions about efficiency, ethics, and human vulnerability in increasingly automated environments. This TFRT project examines the social structures and public interfaces of digital service delivery to identify the impacts, challenges, and opportunities of automation for different stakeholders.

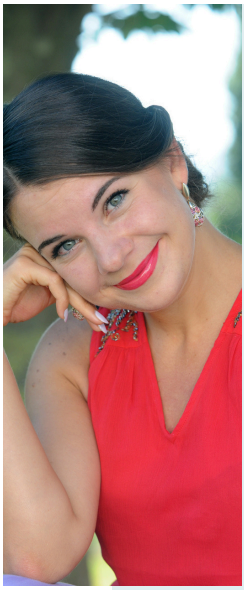
Entrepreneurship in the era of digital and green transformation

DEVELOPED BY MACIEJ PIETRZYKOWSKI, PUEB

This TFRT project investigates the intersection of entrepreneurship with digital and green transformation, exploring innovations in business models, sustainability practices, policy, finance, and technology while identifying system vulnerabilities and relevant stakeholders. Using real-world examples, it examines how digital innovations can drive green transformation, emphasizing interdisciplinary collaboration and considering implications for economic growth, inclusion, policy, and international cooperation.

Thematic structure of the TFRT

Special cases



DEVELOPED BY LILIYA SATALKINA, UWK

Digital entrepreneurship in healthcare: Challenges and opportunities for the new value creation

This TFRT project examines how digital entrepreneurship can transform healthcare systems by leveraging innovative technologies to enhance patient-centered care, address staff shortages, and create sustainable value across organizational, social, and economic dimensions. It explores the complexities of healthcare innovation systems, including interactions among diverse stakeholders, institutional dynamics, and broader societal and technological shifts, to understand how entrepreneurial initiatives can drive systemic and sustainable change.

The Taste of Change: A Transdisciplinary Inquiry into Resilient Winemaking in Austria

Austrian wine production stands at the intersection of nature, culture, and innovation, where centuries-old traditions now face growing pressure from climate change, shifting consumer preferences, and technological transformation. Balancing ecological sustainability, economic viability, and cultural identity has become a critical challenge for this sector, largely composed of family enterprises. This project engages stakeholders from research and practice to map vulnerabilities, explore adaptation strategies, and co-develop pathways for strengthening the long-term resilience of Austrian wine production.

DEVELOPED BY ILJA STEFFELBAUER, UWK

Krems Untere Landstraße - special “cooperation” case

This TFRT project examines the green transition of Krems, focusing on how historic urban areas can shift from car-centered streets to pedestrian- and bike-friendly spaces while balancing the needs of residents, businesses, tourism, and heritage preservation. The project engages directly with local stakeholders to explore how digital innovations, new business models, and sustainable solutions can help small businesses adapt and thrive in a walkable “New Old Town.”

Something Wicked in the Air: Airspace Golf and the Drone Future

This TFRT project explores the complex challenges of integrating drones into Austria’s lowest “Golf” airspace, balancing the needs of commercial innovation, general aviation, safety, ecological concerns, and regulatory frameworks. Through stakeholder engagement with aviation authorities, industry, and public organizations, the project aims to develop socially robust recommendations to guide future legislation and support safe, sustainable, and innovative use of low-level airspace.

Ambassadors of transdisciplinarity

ACROSS 15 SUCCESS STORIES

THE TRANSDISCIPLINARY FIELD RESEARCH TRAINING BRIDGES THEORY AND PRACTICE BY IMMERSING STUDENTS IN COMPLEX REAL-WORLD CHALLENGES, ENABLING THEM TO APPLY CLASSROOM KNOWLEDGE IN PRACTICAL CONTEXTS.

Working collaboratively with stakeholders such as governments, NGOs, and businesses, students address diverse issues ranging from sustainability transitions to innovation management. TFRT integrates multiple knowledge systems, encouraging students to engage with scientists, practitioners and local communities to co-create contextually relevant solutions. The process cultivates collaborative skills, leadership, and critical thinking through fieldwork, participatory problem-solving, and reflective practice, grounding research in real-world dynamics.

To date, fifteen projects have been successfully completed, each demonstrating how knowledge integration can produce tangible outcomes. These projects serve as a valuable research base for establishing educational model grounded in collaboration and co-creation. Importantly, students often become ambassadors of this approach, recognizing the transformative value of transdisciplinarity for their own research and professional activities.

Written stories.....

2024-2025

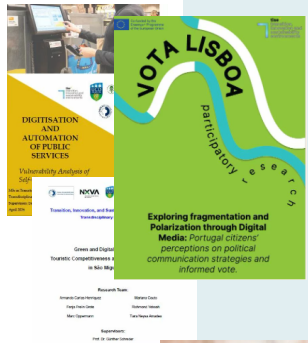
Fading Facades: Revitalizing Untere Landstraße's Vacant Storefront Spaces

Digitizing Mental Health: Entrepreneurial Pathways for AI Chatbots in the Irish Care Ecosystem

Your feed, my identity: the politics of gendered narratives in the online space

AI-Driven Conversational Systems' Adoption in the Iriash Public Sector

Green Compliance and Economic Resilience: How EU Environmental Laws Shape FMCG Practices in Greater Poland



2023-2024

VOTA LISBOA: Exploring fragmentation and Polarization through Digital Media: Portugal citizens' perceptions on political communication strategies and informed vote – Handbook

Digitisation and Automation of Public Services: Vulnerability Analysis of Self-Check-Out-Stores

Green and Digital Transformation: Touristic Competitiveness and Business Enhancement in São Miguel, Azores

Opportunities and challenges of healthcare digital entrepreneurship focused on AI systems in enhancing health equity: Final report

Green Compliance and Economic Resilience: How EU Environmental Laws Shape FMCG Practices in Greater Poland

2022-2023

Sustainable Resilient Communities: The Case of Langau, Austria

Vulnerability Space: Vulnerability Meeting Industry in Austria

Intelligent systems in providing political information/news: How to prevent the destruction of democracy in Austria caused by Intelligent Systems

Appification of the Vienna International Airport

The Role of Data Analytics and Big Data for Austrian MedTech SMEs : A project performed as part of the Transdisciplinary Field Research Training under the TISE Program

Find out more at the TFRT catalogue

Transdisciplinarity "RELOADED": Developing a transdisciplinary educational model

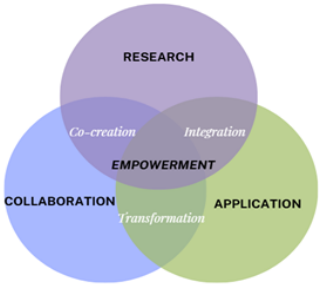
DOI: http://doi.org/10.48341/1kyn-qx50

LILIYA SATALKINA, KAY MÜHLMANN

Transdisciplinarity has become a key paradigm for addressing the complex and interconnected transitions confronting modern societies. Policy frameworks and research agendas increasingly call for transdisciplinary approaches, yet a crucial gap persists in empowering future decision-makers to design and implement such initiatives effectively. Genuine empowerment requires an educational approach that moves beyond narrow disciplinary proficiency and reductionist approach, fostering systemic, collaborative, and reflexive learning. Still, the question remains: do we really know how to integrate transdisciplinarity into teaching practices? The central challenge is to ensure that transdisciplinarity becomes more than a rhetorical label or policy aspiration, but a structural component of education, embedded in curricula, teaching methods, and institutional frameworks for generating tangible learning outcomes and competences for future decision-makers.

As part of education, transdisciplinarity cannot exist without a contextual and methodological basis, which is designed in a way that allows learners to perceive and comprehend why and how to apply such an approach. For bridging the gap between knowledge and action, in a transdisciplinary setting, students should take on a self-confident and self-critical role, becoming active co-designers of their own learning process, engaging in a dialog with teachers and experts on an equal footing. The empowerment of learners should happen through an in-depth perception of a surrounding system and their place in it to recognize themselves as part of a broader setting where cross-boundary (across systems, components) and cross-border (across national and organizational) communication is essential for the anticipation and initiation of innovations as problem- and solution-oriented approaches viable within individual and collective innovation strategies.

Similar to "cybernetics of cybernetics" (von Foerster, 2003), transdisciplinarity in the education process should function both as an approach and as an outcome of knowledge integration, in which learners are not merely recipients or objects but active collaborators. This principle is the backbone and innovation of the *transdisciplinary education model* in TISE. TISE creates a collaborative learning environment in which continuous synergies between *Research context*, *Application framework* and *Collaboration processes* transcend disciplinary and system boundaries, promote discourse among diverse stakeholders, and foster knowledge *co-creation* and *integration*, leading to *transformative* impact through innovation orientations and strategies. Students, educators, entrepreneurs, policymakers, and other stakeholders interact, exchange, and share their knowledge, which leads to an iterative loop of ongoing co-creation, integration, and transformation, and thus improvement.



Strengthening the integration of knowledge between science and practice through continuous collaboration positions such an education process as an integral component of a co-evolutionary processes in innovation systems (Satalkina, Steiner, 2025), making education both a product of ongoing co-creation and a catalyst for continuous transformations, enhancing its potential for systemic impacts on different levels, from individual to society. In this way, transdisciplinarity can be operationalized into an independent education process that is not merely an add-on to a specific research initiative, but a mode of education on a philosophical and methodological level.

About finding a tool that fits my approach: A reflection on transdisciplinarity

DOI: http://doi.org/10.48341/q8xw-kw64

ANNA WEBER

As a generalist, I have worn many hats in my life, from being a Young Fair Trade Advocate and Finance Coordinator, an adventure kids camp leader and language coach, to ultimately also a TISE student and class representative. Driven by my motivation to better understand complex systems, collaboration and our role in shaping a just and equitable future, I started TISE, not yet knowing the role transdisciplinarity would take in my own journey. Exploring the concept through our Design Thinking projects provided me with a methodological toolbox for something I had intuitively applied in practice until then: incorporating diverse stakeholders in projects, embracing ambiguity, and co-creating processes.

Transdisciplinarity fascinates me because it offers both: a solid academic methodology and real-world applicability and flexibility. Previously, I often struggled with the disconnect between research and practitioners' problems. TISE gave me a space where I wasn't only allowed but actually encouraged to think the two together. Through the TFRT and different workshops, I filled my transdisciplinarity toolbox with hardware like Causal Loop Diagrams and Innovation Systems and software like how to manage co-creative processes and engage stakeholders. My master thesis brought all learnings together as I employed a transdisciplinary approach to solve the real-world challenge of how public policies can foster regenerative business models. Through my two practical partners, the Doughnut Economic Action Lab and the Wellbeing Economy Alliance, I had high practitioner co-leadership. The three Expert Round Tables constituting my core data collection showed the fruitfulness of transdisciplinarity in action. Instead of collecting isolated expert perspectives, the stakeholders were able to build on each other's thoughts and co-develop ideas and recommendations. Throughout the research, I embraced the reflexivity of transdisciplinarity and continuously reviewed and shaped my methodology, which was sometimes challenging but extremely helpful when operating in a complex and uncertain space. Being able to situate my research within lived experiences and using the outcomes of my thesis for a new module of the Wellbeing Economy Policy Design course made my research meaningful to me.

IN CHALLENGING TIMES, WE NEED DISCOURSE MORE THAN EVER. BETWEEN PEOPLE WITH DIFFERENT OPINIONS, BETWEEN SILOED RESEARCH AND BETWEEN ACADEMIA, CIVIL SOCIETY AND THE PUBLIC. TRANSDISCIPLINARITY OFFERS AN AVENUE INTO THAT

Anna Weber is passionate about transdisciplinary solutions for regenerative businesses. Having worked at the World Fair Trade Organization and being a TISE graduate shaped her perspectives on designing fair and resilient systems that prioritise people and planet. Currently, she works at the Purpose Foundation, promoting steward-ownership as a solution for businesses to stay self-determined and mission-oriented. She co-develops research and learning materials with the Doughnut Economic Action Lab.

“Secret of Secrets“: Why innovation system is a crucial component of transdisciplinary education

DOI: http://doi.org/10.48341/gha6-4t61

LILIYA SATALKINA

During one of my workshops on the fundamentals of innovation, I asked students whether they thought it was possible not to innovate. One replied, quite sincerely: “I think it’s better not to innovate, because innovation is too complex and brings too many uncertainties.” This answer, though seemingly naive, holds some truth. Innovation is not simply about generating ideas or turning them into products—it is an intervention within a network of social relations and processes that determine whether an invention succeeds and what impact it will have. Ralph Waldo Emerson once wrote: *“the journey is as important as the destination.”* This applies perfectly to innovation: its secret lies not in the brilliance of an idea, but in how it is brought to life. True innovation begins with understanding the context—the system of relationships and conditions that shape an idea’s evolution. Behind every successful innovation is a journey of learning, interaction, and adaptation within this system.

Why does the concept of an innovation system provide a strong foundation for transdisciplinary education? For the past five years, through various teaching activities I have introduced students—among them four TISE cohorts—to the complexity of innovation systems. Each time, I seek new ways to help learners internalize this concept as part of their empowerment. Transdisciplinary education aims to empower individuals to develop solution-oriented innovation strategies for complex problems. Yet here lies a paradox: people are fascinated by complexity but also find it abstract and intimidating. The very phrase “complex innovation system” often evokes something incomprehensible—beyond human grasp. This is where teaching innovation systems becomes transformative: it turns theoretical complexity into a living environment that supports those who create and act within it.

Innovation systems provide a strong conceptual and theoretical basis for transdisciplinarity, while transdisciplinarity enhances the applied relevance of innovation systems—keeping them from becoming purely theoretical constructs of complexity. An innovation system provides a prism for reflecting on and designing innovation strategies and interventions. It reshapes how innovation agents think, perceive, and decide, while building bridges for continuous exchange, integration, and co-creation of knowledge. The structure of an innovation system enables agents to recognize themselves as part of a broader whole, where collaboration is essential for anticipating viable, solution-oriented innovations. This is what can be nameed as empowerment—arising from a deep understanding of the surrounding system and one’s place within it—a fundamental element of contemporary innovation practice and its “secret of secrets.”

Analyzing a complex settings is never simple. How do we define the boundaries of such a system—and, consequently, the scope of its analysis? Identifying relevant stakeholders, collecting the factors that describing the situation’s state—all these are correct steps that can be carried out using various research methods. Yet a crucial precondition precedes them all: developing an in-depth understanding, or rather an intuitive sense, of the situation being analyzed. Through teaching innovation systems, I have realized that the main outcome is not the mastery of terminology, recognition of key scholars, or proficiency in analytical frameworks and modeling. All these elements are essential, but they must go hand in hand with one crucial idea: innovation system is also a mentality—a way of thinking and cultivating this mindset should be a central outcome of empowerment-based teaching.

I CANNOT REVEAL TO STUDENTS THE “SECRET OF SECRETS” OF INNOVATION—BUT I CAN INSPIRE THEM TO REFLECT AND FORGE THEIR OWN PATH, BECAUSE EVERY JOURNEY TOWARD INNOVATION AND CHANGE BEGINS WITH DISCOVERING THE SECRET OF ONE’S OWN EMPOWERMENT.

Liliya Satalkina is a program manager and lecturer in TISE, where she plays an active role in advancing transdisciplinary approaches in education. Her work is grounded in research on complex innovation systems and knowledge integration, which constitute her primary academic field.

Learning to see the system: Reflections on transdisciplinary practice

DOI: http://doi.org/10.48341/gszv-k749

CHIARA MIOZZO

From the moment I first encountered transdisciplinarity in the description of the methodology used in the TISE Master, it almost felt like a systematisation of an obvious need: the need to connect rather than separate, to build networks and break down silos in the knowledgemaking process. In many ways, this way of thinking had always felt like my most natural tendency. Nevertheless, it remains a demanding approach, as it continuously challenges one's assumptions, disciplinary comfort zones, and ways of framing problems.

Our approach to transdisciplinarity did not begin with our final project. It emerged through collaborative work, exchanges with peers from different backgrounds, and engagement with real-world problems where no single discipline, dataset, or perspective could provide sufficient answers. What transdisciplinarity offered was not simply the integration of knowledge, but an invitation to dialogue, between academic fields, between science and practice, and between different ways of understanding reality. It is also an invitation for each actor to avoid positioning themselves as the sole knower of a field, and instead to recognise themselves as one important piece of a larger puzzle.

Being part of a larger puzzle naturally shifts attention from isolated questions to the system as a whole and to the constellation of actors involved. A transdisciplinary process therefore forces you to widen the perspective before narrowing it: to understand interdependencies, incentives, institutional constraints, and practical realities before responsibly zooming in on specific aspects. While research often tends toward a rapid narrowing of scope, transdisciplinarity insists on this initial opening. In this sense, it cultivates a form of intellectual humility on accepting complexity, uncertainty, and partial knowledge as necessary starting points rather than obstacles.

This systemic perspective becomes tangible in practice when working in heterogeneous teams. Collaborating across disciplines and with practitioners made visible how knowledge is shaped by diverse skills, experiences, and viewpoints, and evaluated not only by academic rigor but also by social relevance, usability, and governance dynamics - both positive and negative. Scientists and practitioners alike were pushed to "decanter" their expertise: to translate, question, and reframe it so that it could become meaningful for others in the system. This process was sometimes uncomfortable, but deeply productive.

Personally, these transdisciplinary experiences became the foundation for my subsequent academic trajectory. The practical challenges raised by stakeholders during the project sparked my interest in the legal and governance dimensions of data sharing. This interest was further developed, building on our TFRT project on the role of data analytics and big data for Austrian medtech SMEs, through a thesis focused on the European Health Data Space. These experiences strengthened my awareness of how technical innovation, regulatory frameworks, and societal needs intersect, and how essential it is to approach such questions from a systemic and integrative perspective.

TO ME, TRANSDISCIPLINARITY IS ULTIMATELY NOT ONLY A METHODOLOGY, BUT A POSTURE: AN OPENNESS TO DIALOGUE, A WILLINGNESS TO ENGAGE ACROSS BOUNDARIES, AND A COMMITMENT TO PRODUCING KNOWLEDGE THAT MATTERS BEYOND ACADEMIC CIRCLES. ESPECIALLY IN A WORLD FACING INCREASINGLY COMPLEX AND INTERCONNECTED CHALLENGES, THIS POSTURE IS ESSENTIAL TO CULTIVATE.

Chiara Miozzo is a transdisciplinary researcher with a background in economics and art management and an MSc in TISE, currently pursuing a PhD in EU Law. Her work explores how data governance, technology, and policy interact to support the use of data analytics in disaster risk management, bridging EU data law and disaster law through a legal and transdisciplinary approach.

When Science Is Too Slow and Practice Too Narrow: Why Sustainability Demands Transdisciplinary Work

JOHN WARREN TAMOR

Within the praxis of sustainability, transdisciplinarity is a lens that is already a proviso to our understanding of the nature of wicked problems. But how can we define a genuine transdisciplinary approach/work? These are the questions I continue to ask myself as a practice-oriented researcher. Does science feed from practice more or vice versa? What tensions usually exist between the two, and how can these be resolved/facilitated? What does a transdisciplinary process look like, and how can we implement it? These questions are relevant to me because I come from both worlds. I have worked on the field as a planner, a policy advocate, and a development worker and now, I have started my academic career as an early-stage researcher. Transdisciplinarity is a running debate in both science and practice. One side often dismisses the other as either insufficiently rigorous or insufficiently grounded.

Practice is frequently reduced to a space where "theories" are tested by some academics. I have come across many sustainability researchers who would only talk to managers and workers to validate their frameworks, talking to practitioners who they see as informants and data points who cannot help reshaping the research. Conversely, science is often perceived as slow, abstract, and detached from the urgencies of the "real world". A few former colleagues would detest working with academics and their vague, convoluted vocabularies. We would dismiss blue-sky questions that cannot translate into an immediate action point, and some colleagues can be outrightly anti-intellectual. However, I am glad I have taken up TISE for grad school. TISE made me realize that despite this tension, transdisciplinarity is not a lost cause. In fact, what I learned is that it can work when time is taken to build trust and value different kinds of expertise from the start, most especially in sustainability work where the costs of fragmented knowledge are simply too high.

I am still learning to practice the everyday work of translating concepts and navigating institutional constraints as a budding academic working with practice-oriented stakeholders. This reaffirms my experience that working between science and practice is difficult, but it is necessary and it is far from impossible. Yes, working in between is uncomfortable and demanding; but it is precisely in this in-between space that I see more grounded and reflexive pathways for change emerging.

YES, WORKING IN BETWEEN IS UNCOMFORTABLE AND DEMANDING; BUT IT IS PRECISELY IN THIS IN-BETWEEN SPACE THAT I SEE MORE GROUNDED AND REFLEXIVE PATHWAYS FOR CHANGE EMERGING.

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